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G R A T I S .

A C K L A N D ' S

H I N T S

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F O T H E R G I L L ' S P R O C E S S .

L O N D O N :

H O R N E & T H O R N T H W A I T E ,

O P T I C I A N S & P H O T O G R A P H I C I N S T R U M E N T M A K E R S

To Her Majesty,

121, 122, & 123, NEWGATE STREET, E.C.

1858.

ADDITION TO

ACKLAND'S HINTS ON FOTHERGILL'S PROCESS.

HAVING found that uniformity of development depends much on a uniform film of pure Nitrate of Silver Solution being left on the plate after washing in the Well Bath, fig. 3, the following expedient has been adopted to gain this desirable end :—

On removing the Collodionised Plate from the Bath, fig. 2, it is *gently* ~~washed~~ washed (back and front) in a basin of clean water, ~~or under a tap,~~ until all the greasy appearance presented by the film on being wetted with water is removed. It is then placed collodion side upwards in the Well Bath, fig. 3, into which (for a stereoscopic size plate) a solution, made by dissolving 12 grains of fused Nitrate of Silver in 6 ounces of distilled or filtered rain-water, has been introduced. The plate is allowed to remain undisturbed for about a minute, whilst a second plate is coated and placed in the Bath Solution. The Well Bath is now agitated with some violence for about 30 seconds, so that the solution may thoroughly mix with the moisture on the film.

The plate is then removed by the aid of a silver wire hook, drained for about 10 seconds, with one corner resting on clean filtering paper, and is then ready to receive the coating of albumen as described at page 4.

The solution in the Well Bath will serve for preparing one dozen plates, and must then be thrown away, and a fresh quantity mixed for a further number of plates.

It will be noticed that by adopting this plan, the free Nitrate of Silver left on the plate for decomposition by the albumen is *perfectly pure*, and devoid of any contamination or change that so frequently occurs in the Nitrate Bath.

September 15th, 1858.

ACKLAND'S

HINTS ON FOTHERGILL'S PROCESS.

In the *Times* of April 25th appeared a letter from Mr. Fothergill, announcing the discovery of a new dry process, which, in my hands, has proved so successful that I have deemed it advisable to give a minute description of the mode of manipulation; but, prior to doing so, it may be mentioned that this process is far superior to the Collodio - Albumen, Gelatine, Meta - Gelatine, or Oxymel process, possessing a hard surface when dry, is very quickly prepared, yields negatives of great softness and delicacy, develops with rapidity, and if an opinion may be formed from *no deterioration or stains on plates after being prepared a month*, we may safely infer they will keep any length of time.

Before entering into a description of the manipulations, I propose to give directions for preparing the various solutions. These solutions are—

Cleansing Mixture.
Iodized Collodion.
Prepared Albumen.
Bath Solution.
Pyrogallie Acid Solution.
Silver Developing Solution.
Fixing Solution.

CLEANSING MIXTURE.

Tripoli..... $\frac{1}{2}$ ounce.
Common Washing Soda $\frac{1}{2}$ ounce.
Filtered Water 4 ounces.

Dissolve the washing soda in the water, then add the tripoli, and shake well together until perfectly mixed.

IODIZED COLLODION.

From a series of experiments I infer that the main point of success in this process turns on the employment of a suitable Collodion, or, at least, that different kinds of Collodion will require far different manipulations. My first experiment was made with a Collodion, introduced by myself for the Collodio - Albumen process, but with this my success was very limited, and after various trials a formula suggested itself, which has been adhered to with perfect success. This Collodion is supplied by Messrs. Horne and Thornthwaite, ready for use, under the name of "Iodized Collodion for Fothergill's process." It keeps good any length of time, and the manipulation here given refers especially to this Collodion.

PREPARED ALBUMEN.

Take three eggs, carefully separate the yolk and germ; pour the white into a measure, which will give about 18 drachms of Albumen. Add to this, one ounce of water and nine drops of liquor ammonia; stir the whole together with a glass rod for two minutes, then leave it to rest for about twelve hours. Then strain through fine muslin, and store away in a bottle for use.

Albumen, thus prepared, will keep good a considerable time, but must be diluted with an equal bulk of water, and filtered through sponge, just prior to

being poured on the plate. Decomposition shews itself by the fluid becoming opaque, and with stringy masses floating with it. When this occurs, reject it at once, and prepare a fresh quantity.

BATH SOLUTION.

Nitrate of Silver fused.....	1 ounce.
Iodide of Potassium	2 grains.
Glacial Acetic Acid	4 drops.
Distilled or Filtered Rain-water	12 ounces.

Dissolve the Nitrate of Silver in three ounces of the water, and the Iodide of Potassium in one ounce of water. Mix these two solutions, shake well, then add the remaining eight ounces of water, and filter to separate the yellow precipitate which is formed, and to the filtered liquid add the Acetic Acid.

This solution will remain in perfect action sometimes for months, merely requiring the addition of a little fused Nitrate of Silver to be added from time to time, to keep up the solution to its original strength.

PYROGALLIC SOLUTION.

Pyrogalllic Acid	8 grains.
Citric Acid	2 grains.
Distilled or Filtered Rain-water	4 ounces.

Dissolve and Filter.

This solution will not keep good more than a few days in summer.

The above strength of Developing Solution is to be employed when the operating-room is about 60° F.; but the quantity of Pyrogalllic Acid must be diminished one-half in summer and doubled in winter.

SILVER DEVELOPING SOLUTION.

Nitrate of Silver	20 grains.
Distilled or Filtered Rain-water	4 ounces.

Dissolve.

FIXING SOLUTION.

Hypo-sulphite of Soda	4 ounces.
Water	16 ounces.

Dissolve.

CLEANING THE PLATE.

It is advisable to use none but the best patent plate-glass, and the edges should be just sufficiently ground to prevent the sharp corners cutting the fingers. To clean these, pour a teaspoonful of the cleansing mixture over

the centre of the plate, and with a plectet of linen, well rub it over every part of back and front; then rinse it in a basin of cold water, or hold it under a tap so as to remove every particle of the mixture; next, without waiting for the plate to dry, remove all traces of moisture with a linen cloth, and polish with another linen cloth, holding the plate by the cloth, and not by the hand, so as to prevent the slightest grease being communicated to it. The cloths employed should be of a material sold as "fine diaper," and must be well freed from grease or soap, by careful washing in soda and water, then plentifully rinsed in water and dried; also the one used as a polisher should be kept quite dry. Occasional breathing on the plate during the polishing, and then holding it obliquely, so that the moisture deposited may be seen by reflected light, will serve to point out whether a plate is clean or not. If the moisture of the breath is deposited in patches, more cleaning is required; but if the deposit is evenly spread over the whole surface, it may safely be considered as clean. Glass plates, after being once used, require to soak an hour in a solution of four ounces of common washing soda to one pint of water, so that the hardened coating may be softened and easily rubbed off: they have then to be cleaned as before mentioned for new plates; but, should the surface have an iridescent appearance, through a slight reduction of silver, it will be necessary to soak in a mixture of equal parts of common nitric acid and water for ten minutes; then rinse in water, and proceed to clean as before described.

COATING WITH

IODIZED COLLODION.

Before proceeding to coat the plate, it is necessary that the Iodized Collodion should have been allowed to stand for an hour or more, so that any floating particles may fall to the bottom; and in all cases the dust and dried crust of the Collodion which may adhere to the neck

of the bottle must be carefully removed, otherwise spots or stains will be produced on the plate.

If particles of dust are floating in the air of the operating room, it will be useless to attempt to coat a plate, as they will deposit themselves on it and serve as a nucleus for a stain in the after-process. For this reason it is recommended to clean the plates in another room, so as not to disturb the atmosphere of the operating room from this cause.

Having ascertained that the glass plate is perfectly clean, grasp it firmly by applying the tips of the fingers and thumb of the left hand to the longest edge, then take the neck *p* of the plate-

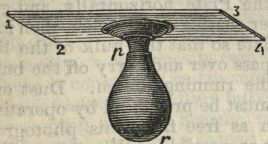


Fig. 1.

holder (Fig. 1) between the first and second finger of the right hand; press the ball at *r* inwards with the thumb, and apply the concave part to the centre of the glass plate; remove the pressure of the thumb, and the plate will be found to adhere.

When such is the case, transfer the ball to the left hand, and hold it so that the glass plate shall be horizontal; then remove the stopper from the Iodized Collodion bottle, and, holding it in the right hand, pour the Collodion on the glass plate in sufficient quantity to form a circular pool extending to near the edges; next incline the plate so that the fluid may flow to corner No. 4, fig 1, then to No. 3, then to No. 2, and drain the superfluous Collodion back into the bottle by corner No. 1, holding the plate in a vertical direction. Give the plate a rocking motion on the neck of the bottle by very lightly raising and depressing corner No. 4, so that any lines or furrows which are found may run into each other. Continue this until the covered surface of the plate appears thoroughly set from the evapo-

ration of the ether;* when this takes place, compress the ball of the plate-holder and detach it from the plate. Now lay the plate collodion-side upwards on a glass dipper and plunge it with *one downward movement* in the Collodion Dipping Bath (Fig. 2), filled to

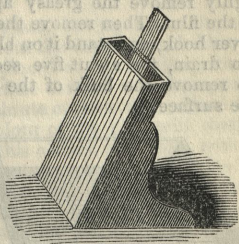


Fig. 2.

within an inch of the top with the Bath Solution, made, as before described, and carefully filtered.†

The collodionised Plate is allowed to remain in the bath one minute; it is lifted out two or three times, in order to facilitate the removal of the *oily appearance* which the Plate now presents. When the surface appears uniformly wetted, the plate is removed from the dipper, and the excess of solution drained off; it is then placed, collodion-side up-

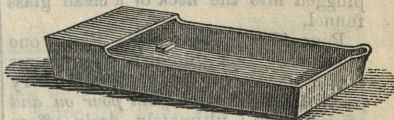


Fig. 3.

wards, in a Well Bath, fig. 3, into which (for a stereoscopic size Plate) six ounces of water has been introduced. The Plate is then allowed to remain undisturbed whilst a second plate is coated with Col-

* Collodion operators will understand that a longer interval, by about one-fourth, must be allowed to elapse between coating the plate, and immersing it in the bath, than in the ordinary Collodion Process.

† This, and all other operations (except exposure in the camera), must take place in a room from which white light is carefully excluded.

lotion, and placed in the Bath Solution, (which usually occupies about one minute). The lip end of the Well Bath is now raised to nearly a vertical position, and then lowered *ten* times, so that the water may as many times run off and on the plate, and thus uniformly and thoroughly remove the greasy appearance of the film. Then remove the plate by a silver hook, and stand it on blotting paper to drain, for about five seconds, so as to remove the bulk of the water from the surface.

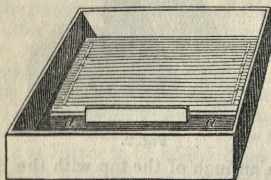


Fig. 4.

When sufficiently drained, attach the globe plate-holder to the Plate, and bring it horizontal, then pour over its surface dilute Albumen, made as follows:—Take of the prepared Albumen, made as before described, and distilled or filtered rain water, of each half-an-ounce, stir together with a clean glass rod, and filter through a fragment of sponge, slightly plugged into the neck of a clean glass funnel.

Pour (for a stereoscopic Plate) one drachm of this dilute Albumen over the surface, so as to cover every part; drain off, *and again pour on and off six times*; ultimately, drain off as much as possible of the excess of the Albumen, and place the Plate face upwards in a washing-tray, made as fig. 4, previously filled with water; shake the tray from side to side, with some violence, so as to agitate the water thoroughly for ten seconds; drain off the water, and again fill the tray by pouring fresh water into it, so as to fall at the part *a* of the tray, and *not on the surface of the film*. Again agitate for ten seconds, throw out the second water, fill up and agitate again for another ten seconds; then lift the plate out with a sil-

ver hook, and stand up to drain and dry, in a dark cupboard perfectly free from light, with one corner resting on two or three thicknesses of filtering paper; so that the upper surface may touch the wall at *one point only*.

It is found most advisable to reject the Albumen after being once used, and to coat the next Plate with another quantity.

In coating with Albumen, the presence of air-bubbles or dust must be guarded against. The former can easily be done by taking care, in pouring the Albumen into the measure and on the Plate, not to pour so as to generate air-bubbles in the liquid. But should any be detected, hold the Plate horizontally, and give it another coating of Albumen, then incline the Plate so that the bulk of the liquid shall pass over and carry off the bubbles with the running stream. Dust on the plate must be prevented by operating in a room as free from this photographic enemy as possible. When these Plates are thoroughly dry, they may be placed in the camera backs, or stowed away in light-tight boxes, and carefully protected from chemical or sulphurous vapours, and as far as can at present be judged, they will keep an indefinite time, *as not the slightest deterioration or loss of sensibility has occurred in plates kept a month in summer.*

EXPOSURE IN THE CAMERA.

The time of exposure in the camera varies according to the intensity of the light, and the aperture and focal length of the lens; therefore, to give the exact time would be impossible, but as a general rule, a light building well illuminated by sunlight would require about:—

$\frac{1}{2}$ minute with lens of $4\frac{1}{2}$ in. focus, and $\frac{1}{8}$ in. stop.			
1	"	$4\frac{1}{2}$	" $\frac{1}{4}$ "
$1\frac{1}{2}$	"	10	" $\frac{1}{2}$ "
3	"	14	" $\frac{3}{4}$ "
4	"	16	" $\frac{1}{2}$ "

A light building with foliage requires about one-fourth longer exposure; but for masses of rock, and foliage of a dark character, three or four times the expo-

sure above stated. In winter, all these exposures must be doubled; *but at all times expose for the deepest shades, as the high lights are but little liable to injury from over-exposure.*

DEVELOPING THE IMAGE.

The Plate, on being taken into the operating room, is placed on a levelling stand, and distilled or filtered rain-water poured over it for half a minute, so as completely to moisten every part of the surface and remove any particles of adherent dust; then drain slightly, and pour over its surface a mixture of (for a stereoscopic Plate) one drachm of silver developing solution, and four drachms of pyrogallic solution. Pour this on and off repeatedly, from opposite corners, so as to keep it constantly on the move.

The image appears rapidly;* but should the developing solution become turbid, throw it away, and mix a second quantity, and if the development appears unequal, wash the Plate with water, drain slightly, and pour on newly-mixed developing fluid repeatedly, to the weakest part, until an equalisation is effected; then cover the whole surface, and continue pouring on and off until the image is sufficiently intense. Lastly, wash so as to free the surface from the developing fluid, and the picture is ready for fixing.

In general a good picture takes from two to four minutes to develop, and the condition of the sky will serve to indicate whether the proper amount of exposure has been given. An under-exposed picture has a dense sky, but the details in the deep shades are deficient; whereas in an over-exposed picture the details are well out, but the sky is transparent and generally of a reddish tint; such pictures, moreover, possess no contrasts of light and shade; whereas when the proper amount of exposure has been

given, the sky is perfectly opaque, the middle tints finely developed, and the details apparent in the deepest shades with perfect contrasts of light and shade.

FIXING THE IMAGE.

The Plate, having been thoroughly freed from the developing fluid by washing, is placed on the levelling stand, and the surface covered with fixing solution. In a minute or two the yellow opalescent colour of the film will disappear; when this occurs, *well wash with water*, and lean the plate against the wall to drain and dry. The surface, when dry, is sufficiently hard to resist any slight violence; but as a further protection, warm the plate slightly all over near a good fire, then pour over its surface Horne and Thornthwaite's Negative Varnish in the same manner as Collodion is applied. Allow the superfluous varnish to drain back into the bottle; hold the plate again before the fire until the whole of the spirit is evaporated, and, when cold, the plate is ready to be printed from, so as to produce any number of positive pictures, on either paper or glass.

CONCLUDING HINTS.

Clean the glass Plates carefully with very clean cloths, avoiding especially those used to wipe the hands after coating with Albumen.

Filter the Bath Solution whenever about to prepare a lot of plates; and, when not in use, keep it in a stoppered bottle in a dark corner of the operating room, so that the full glare of daylight may at no time fall on it.

Allow the Collodion to set thoroughly before immersion in the Nitrate Bath, or it may become detached in washing or after fixing; but, as a matter of course, this must not be carried so far that any part may become dry, or the Nitrate Bath will act unequally on the film.

Iodized Collodion that has become too

* If the temperature of the operating room is allowed to fall below 60°, the development proceeds more slowly, or even ceases altogether. In such cases heat the developing solutions to about 80°, and renew as often as necessary.

thick for use by evaporation, may be diluted with rectified Sulphuric Ether; but *Methylated* Ether must not be used for this purpose.

After sensitising the Collodion film, wash as described, and do not allow water to fall directly on the surface of the plate, or unequal patches will show themselves in developing.

The dilute Albumen that has been employed to coat one Plate must be thrown away, and a second quantity taken for the next Plate.

Use two globe plate-holders, one for collodionising the Plate, and the second for coating with Albumen, but carefully avoid using the one ordinarily employed for the Albumen to coat a plate with Collodion, as Albumen would thus be introduced into the Bath Solution, which would speedily spoil it for the purpose.

Handle the coated Plate as little as possible, and always wash the hands after coating with Albumen, before removing another plate from the bath; indeed, never take up a Plate without washing and drying the hands on a clean towel.

Give a full exposure in the Camera, or the resulting negative will be harsh, and produce black and white prints without middle tints.

Keep the glass used for the developing mixture perfectly clean.

Take especial care that no gleam of white light falls on the Plates during preparation or drying, and stow away in *light-tight* boxes of mahogany or tin, if not required for immediate use.

Guard against over-development, as a comparatively weak negative by this process will print well, owing to the nature of the deposit forming the shades having a greater action in stopping the light whilst printing, than that produced by the ordinary Collodion process.

I have thus given what I hope will prove a clear description of this beautiful process, and as success with it follows only from paying attention to *minute* particulars, I would ask those who are led to make a trial of it from my description to *strictly* follow the plan I have laid down, as a slight alteration of manipulation frequently gives rise to vexatious failures. Should any difficulty arise, I shall be happy to answer any queries by post; but it would much facilitate my doing so if such queries were written on paper, distinct from the letter which accompanies it, leaving sufficient space between each query for my reply.

WILLIAM ACKLAND.

123, Newgate-street, London, E.C.,
September 1st, 1858.

IODIZED COLLODION

FOR FOTHERGILL'S PROCESS.

THIS Collodion is supplied ready for use, and each sample is carefully tested by Mr. ACKLAND, so as to ensure constant uniformity.

2 ounces, in Bottle.....	2s.
4 ounces, in Bottle.....	3s. 6d.
10 ounces, in Bottle.....	8s.
One Pint (20 ounces), in Bottle.....	15s.

This Collodion is only supplied in the above quantities. Each bottle is secured by a label bearing the name of HORNE AND THORNTHWAITHE, without which none is genuine.

